



ESTO Roadmapping Activity

***Presented to the Technology Strategy Team
meeting***

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3/2/00***

ESTO

Earth Science Technology Office 1



Today's Objective

- **Provide background: brief history of ESTO roadmaps**
 - What has already been done
 - What remains to be done
- **Describe current roadmap activity**
 - Motivation
 - Approach
 - Schedule



Some History

- Easton meeting set out a series of measurements that were needed by Science community
- A brief study was led by HQ about 1 year ago to provide preliminary approach for those measurements
- Technology needs from those approaches have been captured and entered into the ESTO capability needs matrix
- First roadmaps were produced in August/September of 99
 - A briefing to OMB
 - Based on analysis of BMPS technology needs
 - Measurement (i.e., NOT technology) oriented
 - Multidisciplinary look at technology needed to enable a measurement
 - Limited funding information
- Second set of roadmaps developed by ESTO between October 99 and January 00.
 - More detailed than previous
 - Oriented to technology disciplines, not measurements
 - Better attempt to capture funding requirements



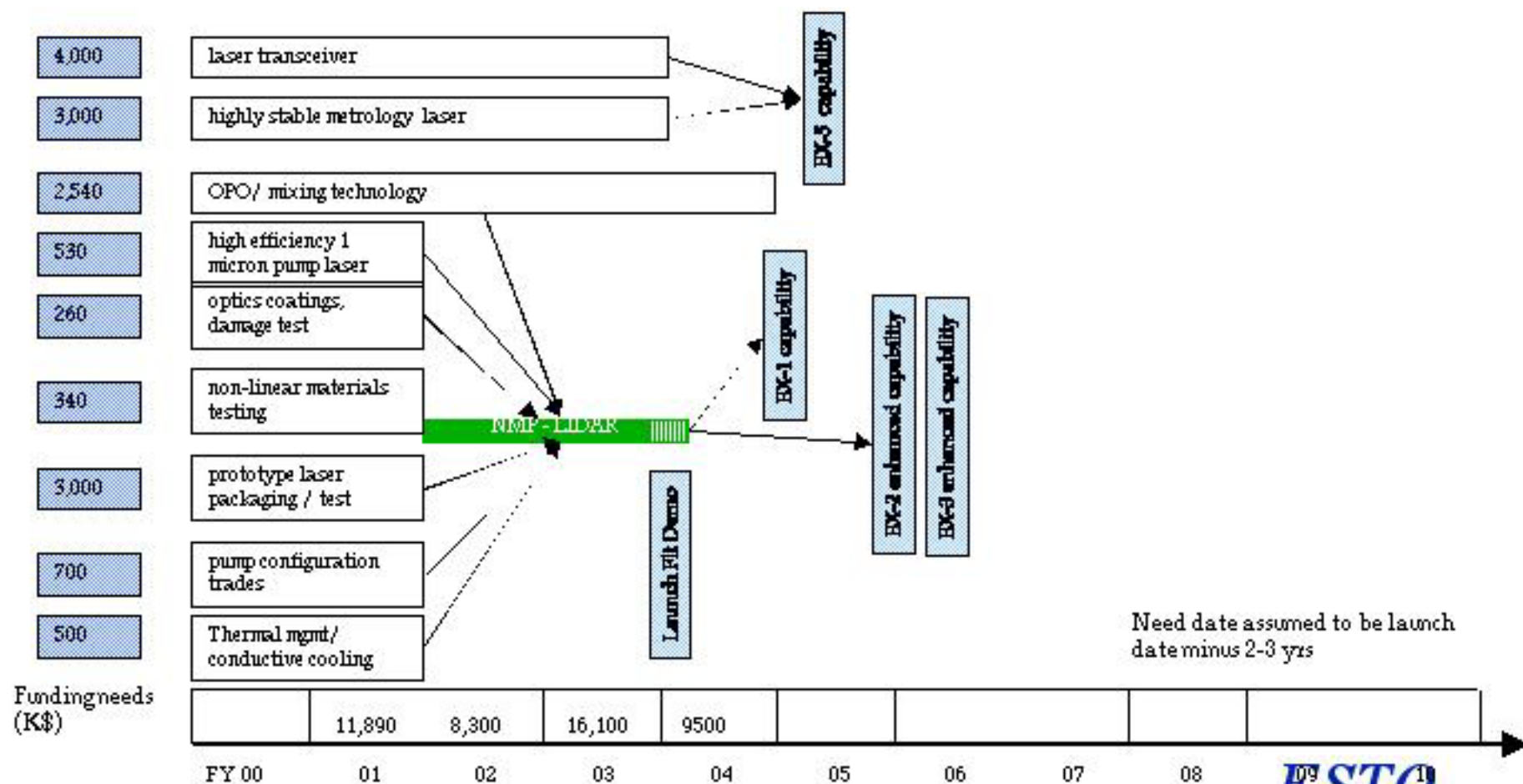
Roadmap Example: Laser/Lidar

BMP MEASUREMENT REQUIREMENTS ADDRESSED:

- EX-1, EX-2, EX-3, EX-5, EX-6
- OP-2
- ES-10

MAJOR TECHNOLOGY CHALLENGES:

- completely solid-state space-qualified transmitter..
- highly stable laser to enable micron level s/c-to-s/c metrology





Current Roadmap Status

- Have 16 roadmaps in the following areas:

Platform

Material & Structures
Comm
GN&C
C&DH
Power

Instrument

Detectors & Filters
Radar
Radiometers
Lidar/ Laser
GPS
Optics
Spectrometers

Info Systems

Intelligent Platform control
On-board processing/ inst. cont.
On-board data storage/ processing
Transmission

- **Assessment:**

- Funding needs not well defined
- Backup data (rationale for.../ alternatives to.../decision points...) non-existent
- Community outside of ESTO generally unaware of these roadmaps
- Roadmaps present no priorities



New Roadmapping Activity

- **Motivation**
 - To answer outstanding needs
 - Define funding needs
 - Provide backup data (rationale for.../ alternatives to.../decision points...)
 - Engage / elicit buy-in from larger community outside of ESTO
 - Establish/ advertise ESTO priorities for funding
 - To support parallel activities underway within ESE side of NMP
- **Approach**
 - Establish rationale for choosing priority investment areas
 - Propose priority technology areas
 - Develop preliminary data package for priority roadmaps
 - Distribute that data package to teams of involved technologists and scientists for review and augmentation
 - Conduct workshop to rationalize input in preliminary data package
 - Incorporate changes into final roadmap package
 - Visually exciting
 - Annotated for clarity
 - Backup including strategic decision information



Approach Details

Rationale for selecting priorities

- **Rationale for choosing priority investment areas**
 - **Use 'needs' from BMS (Easton)**
 - **Use desired measurement dates from SIP V.2**
 - **Target launch dates of '05-'07 (3 years) for technology investments**
 - **Nearer measurements nearly past technology freeze dates**
 - **Later measurements will get priority attention in 3 years**
 - » **When measurement needs are better defined**
 - » **When certainty of measurement is higher**
 - **Augment BMS with newer needs**
 - **CO2 measurement**
 - **Surface water measurement**
 - **Temper with subjective judgment about high priority measurements**



Approach Details

Priorities Proposed

Category	ES-1	ES-4	ES-7	ES-8	ES-9	EX-1	EX-4A	EX-4B	EX-5	EX-6	EX-7
COMM	3	1	1							3	
Detectors/filters	1										
GN&C	1			1	1				2	1	
Ground Processing Systems											2
Intelligent Platform Control		1	1	1			1			1	
Laser/Lidar			2	1		13			2	5	
Materials and structures			3	1			2	2			
On-board Data Processing and Intelligent Sensor Control	4	3	3		8		6	6		7	2
On-board Satellite Data Organization, Analysis and Storage	2		2								
Passive radiometers, FTS			3		4		10	11			
power										3	
Radar				2				10			4
spectrometers		2	1								
Transmission and Network Configuration		1			5		2	2			
Grand Total	11	8	16	6	18	13	21	31	4	20	8
optics											
measurement importance	0	0	***	0	***	*	**	**	*	*	*

Proposed priority technology areas

Platform

M&S (large deployables)

Instrument

Radar

Radiometers

LIDAR / Laser

Info systems

On-bd. proc. / sens. cntrl

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Approach Details

Preliminary Data Package

- **Scope of roadmap**
 - Which science measurement(s) addressed
 - 05-07 launch application
 - 08-10 launch application (if applicable, lower priority)
 - Parametric description of science capability needed
 - 05-07 launch application
 - 07-10 launch application (if applicable, lower priority)
 - Description of current SOA
 - Science measurement capability with SOA technology
 - Contributing components of technology capability (problem decomposition)
 - Limiting factors or obstacles to development
- **Currently funded work/ level of investment needed by ESTO**
- **Component development schedule and investment plan**
- **Milestones of measurable achievement**
- **Pictorial representation of how components combine**
 - Parallel paths and decision points (if applicable)
- **Off-ramps.**
 - When
 - Why (ie, what is the roadblock?)
 - Alternatives if executed



Approach Details Workshops

Length

1 day

Number

Equal to number of technology priorities selected

Date

Each independent, must be before mid- April

Participants

5 relevant scientists

5 involved technologists

2 co-chairs (one scientist, one technologist)

1 facilitator from ESTO

Participants broadly distributed from across agency

Cross-support to/from NMP

Purposes

Advertise ESTO intentions

Add depth to ESTO planning product

Acquire community buy-in to ESTO program

Products

Augmented data packages

Use

Source materials for ESSAAC - TSC briefing on May 2

Potential separate briefing to HQ

OMB briefing

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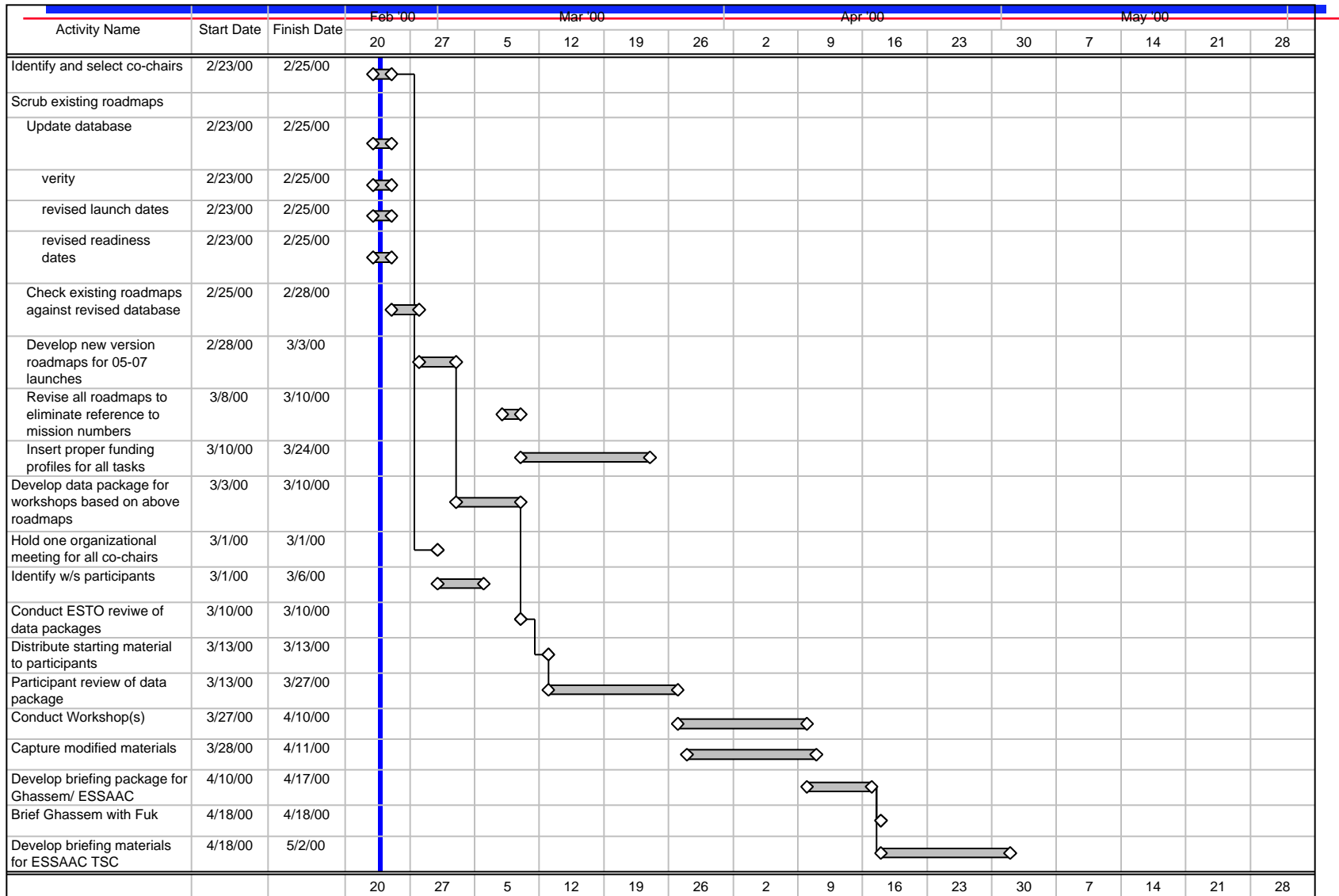
Workshop Leads/ Status

	<u>Facilitator</u>	<u>Science Lead</u>	<u>Technology Lead</u>
Laser/ Lidar	Frank Peri	TBD	TBD
Radar	Loren Lemmerman	Paul Rosen	TBD
Radiometers	Pepper Hartley	TBD	TBD
On-board processing / sensor control	Steve Smith	TBD	TBD
Materials and Structures	Lisa Callahan	TBD	TBD

- **Status**
 - ‘Needs’ database clean-up underway
 - Workshop leads being identified
 - Preliminary data packages under development



Schedule



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